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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/552,497

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EXAMINER

TRAN, BINH X

ART UNIT

PAPER NUMBER

1792

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/552,497	Applicant(s) HANSEN ET AL.	
	Examiner Binh X. Tran	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/07/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Interpretation

1. Claim 14 is a product-by-process claim. According to the MPEP 2113, "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production." Thus, the examiner does not give any patentable weight on the method of production in a product-by-process claim.

Claim Objections

2. Claim 6, 15 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. In claim 6 and 15, the applicants wrote "wherein step i) is performed after step ii) or vice versa". The examiner interprets this limitation means step (i) is performed after step (ii), or step (ii) is performed after step (i) [i.e. that is step (i) and step (ii) can be performed in any order]. Thus, claims 6 and 15 fails to further limit the subject matter of previous claims 4 or 5.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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4. Claim 14 is rejected under 35 U.S.C. 102(b) as being anticipated by Song et al. (US 5,935,643).

Respect to claim 14, Song discloses a gas diffusion electrode comprising: a pre-shrunk porous hydrophobic substrate (i.e. waterproof carbon paper having pores; See col. 3 lines 10-17) having a dried slurry catalyst form onto the area of the substrate (col. lines 25-65, col. 4, Fig 1-3).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1, 3, 7-11, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Song et al. (US 5,935,643) in view of Fan et al. (US 2002/0134501 A1).

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Respect to claim 1, Song discloses a process for forming a gas diffusion electrode comprising:

a) treating an area of a pre-shrunk porous hydrophobic substrate so as to restrict the slurry deposit to the area (See Fig 1 first three step on top right corner, col. 3 lines 10-16; col. 4 lines 10-15);

b) dispensing a slurry of catalyst onto the area (Fig 1, col. 3 lines 18-40, col. 4 lines 16-24);

c) removing liquid from the dispensed slurry (i.e. drying process) (See Fig 1, col. 3 lines 41-46, col. 4 lines 25-30);

d) treating the dried slurry (col. 3-4, Fig 1).

Song fails to disclose the step of treating the dried slurry to remove organic materials. However, Song clearly teaches to treat the dried slurry. Song also teaches the slurry contain solvent, and drying to remove the solvent. Fan teaches the catalyst slurry comprises water and isopropanol and glycol as a solvent (paragraph 0036, 0039). Fan further teaches to organic solvent (i.e. glycol, Nafion) to optimized viscosity and to eliminate any cracks on the gas diffusion layer (paragraph 0039). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Song in view of Fan by using organic solvent and remove the solvent during the drying process because it helps to optimize the viscosity and eliminate crack on the gas diffusion layer.

Respect to claim 3, Song disclose the step of treating the hydrophobic substrate render the substrate less hydrophobic (i.e. waterproofing or water repellent) (See Fig 1, col. 3 lines 10-16, col. 4 lines 10-15). Respect to claim 7 and 9, Song discloses the step

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of heating (i.e. drying) to evaporate and solidifying the liquid (Fig 1, col. 3 lines 41-47, col. 4 lines 25-30). Respect to claim 8, Song teaches the step of heating to dry the slurry. Fan teaches the step of drying to remove the organic solvent (paragraph 0042, 0044, read on "temperature sufficient to decompose the organic materials).

Respect to claim 10, Song disclose includes pre-shrinking the hydrophobic by heating treatment at a temperature of 370 °C(col. 4 lines 10-15), wherein the drying process is at 200-250 °C (col. 3 lines 42-45) and treating the slurry at 350 °C (col. 4 lines 65) (read on "at a temperature greater than used in either of steps c or d).

Respect to claim 13, Fan discloses step c and d are performed in a single step (paragraph 0039, 0042, and 0044).

Respect to claim 11, Fan discloses the step of cutting the catalyst (using the cutter 33) deposit on the underlying portion of the substrate to provide a porous and conductive catalyst mass supported on the substrate to obtain the desired size (See paragraph 0039, 0044, Fig 2). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Song in view of Fan by cutting the deposit catalyst because it helps to obtain the catalyst portion having desired size.

7. Claim 2, 4-6, 12, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Song and Fan as applied to claims 1, 3, 7-11, 13 above, and further in view of Furuya (US 5,618,392).

Respect to claim 2, Song and Fan fails to disclose forming a well at the area in the hydrophobic substrate. Furuya discloses a substrate having a well (i.e. concave groove) in order to enhance the gas diffusion electrode (See fig 8-9, col. 6 lines 25-65,

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Fig 11-12). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Song and Fan in view of Furuya by forming a well because it enhance gas diffusion electrode.

Respect to claims 4, 6, 15, Furuya teaches forming a well in the substrate (Fig 8-9) and surface treating the hydrophobic substrate to render the substrate in the well less hydrophobic (i.e. hydrophilic, See Fig 8, col. 6 lines 25-45). Respect to claim 5, Furuya disclose the surface treating reduce the hydrophobicity (i.e. result in hydrophilic) only in the area of the substrate within the well (See Fig 8 col. 6 lines 25-40).

Respect to claim 12, Furuya teaches the substrate comprises PTFE in order to support catalyst layer (col. 4 lines 30-44, 60-65, col. 6 lines 25-44). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Song and Fan in view of Furuya by using PTFE substrate because it is capable of support catalyst layer.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Binh X. Tran whose telephone number is (571)272-1469. The examiner can normally be reached on Monday-Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Binh X Tran
Primary Examiner
Art Unit 1792

/Binh X Tran/
Primary Examiner, Art Unit 1792